Henry Elliott, 25, mechanical engineer, Glasgow ; (£50 each) Jas. H. Binfield, 23, engineer student, Preston ; George U. Wheeler, 20, engineer apprentice, London ; William Day, 22, fitter, Wolverton ; Samuel Lea, 25, turner, Crewe ; Evan Parry, 22, engineer student, Bangor ; Thomas O. Mein, 23, engineer, Stratford, E. ; Benjamin Conner, 23, apprentice engineer, Glasgow ; Thomas J. Bourne, 23, marine engineer, Tunbridge Wells ; George Ravenscroft, 25, fitter, Crewe ; Thomas F. Parkinson, 22, engineer student, Bury, Lancashire.

The following is the list of successful candidates for Royal Exhibitions, National Scholarships, and Free Studentships, 1888 :—National Scholarships : John B. Coppock, 23, student, Nottingham ; James G. Lawn, 20, mining surveyor, Barrow-in-Furness ; Herbert Grime, 19, teacher, Manchester ; Alfred Stansfield, 17, student, Bradford ; John Eustice, 24, engine fitter, Camborne ; Edwin Wilson, 19, student, Bradford ; Lionel M. Jones, 18, student, Llanelly ; Joseph Jefferson, 20, student, Bradford ; Henry T. Bolton, 15, student, Newcastle-on-Tyne ; Ben. Howe, 18, student, Manchester ; John Yates, 20, draughtsman, Manchester ; Harry Cavendish, 17, student, Manchester. Royal Exhibitions : Thomas S. Fraser, 17, laboratory assistant, Glasgow ; Benjamin Young, 23, electrical engineer apprentice, Belfast ; James Harrison, 29, shoemaker (rivetter), Northampton : John D. Crabtree, 16, student, Bradford ; Joseph Burton, 19, student, Manchester ; John Taylor, 21, engineer, Glasgow ; Joseph Husband, 17, student, Sheffield. Free Studentships : Thomas Beatham, 16, student, Newcastle-on-Tyne ; Charles H. Kilby, 20, engineer apprentice, Crewe ; George H. Gough, 17, student, Bristol ; Henry E. Cheshire, 24, fitter, Crewe ; Ernest W. Rees, 20, engineer apprentice, Carnarvon ; Stanley H. Ford, 17, student, Bristol.

UNIVERSITY COLLEGE, LONDON.—*Gilchrist Engineering Scholarships.*—An entrance scholarship will be offered next month (September). The value is £35 per annum, tenable during two years, and the competition is limited to those who have not previously been students of the College, and who will not complete their nineteenth year before October 1. Every candidate must declare his intention of taking, at least, the two first years of one of the engineering courses, and the second payments will depend upon his success during the first year and the arrangements he makes for the second year's study. The subject of the examination will be mathematics, and any two or more of the following five subjects : mechanics, mechanical drawing, an essay on a given subject, French or German, and the use of tools. A senior scholarship of £80 will be awarded at the close of the session. Candidates must have attended College classes in the following subjects during the whole of the session : applied mathematics, physics, engineering, engineering drawing, and geology. The results of the class examinations will decide the obtainment of the scholarship, providing sufficient merit has been shown to justify the award. There are also entrance and other exhibitions and scholarships given at University College for mathematics, physics, chemistry, classics, German, French, art, Greek, Hebrew, jurisprudence and political economy, philosophy of mind and logic, English literature, medicine, surgery, pathology, and physiology.

SCIENTIFIC SERIALS.

The Quarterly Journal of Microscopical Science for July 1888 contains the following :—On *Haplodiscus piger*, a new pelagic organism from the Bahamas, by W. F. R. Weldon, M.A. (plate 1). The body is ellipsoidal in outline, the antero-posterior diameter being the shortest ; in an average specimen the long diameter measured 1·3 mm., the short 1·1 mm. The dorsal surface is slightly convex, the ventral flat, but concave on muscular contraction. There is a cuticular body wall ; a muscle layer on the ventral surface ; the innermost body layer is a protoplasmic tunic, embedded in which are numerous mucous glands opening through the cuticle. At the anterior end of the body, embedded in the protoplasmic tunic, is the brain. The alimentary tract occupies the centre of the body. It has an oval opening : the tract itself consists largely of protoplasm, which even protrudes, pseudopodia-like, from the oval opening. A pair of ovaries and a testis are present. Yellow cells are scattered quite irregularly throughout the body. The systematic position is doubtful. The author suggests that it may be a free-living Cestode.—On the true teeth and on the horny plates of Ornithorhynchus, by E. B. Poulton, M.A. (plates 2–4). The species of Ornithorhynchus have always been described as without true teeth ; but, as is well known, they possess eight horny plates—two on each side of each jaw. True teeth are, however, developed at an early stage beneath the horny plates ; there are certainly three on each upper maxilla, and while two only have been proved to exist on each of the lower maxilla, it seems extremely probable that an additional pair will be found. The position and structure of these teeth are eminently mammalian, and are treated of in detail. The horny plates gradually intrude into the alveoli of the true teeth, which, ceasing to come to the surface, are absorbed, so that in the adult animal the bone and the under surface of the epithelium are in close proximity.—Note on the fate of the blastopore in *Rana temporaria*, by H. Sidebotham (plate 5). Differs from Balfour in concluding that the neural folds do not inclose the blastopore, the closure of the blastopore being effected subsequently to the meeting of the neural folds ; and still more from Spencer, inasmuch as the anus is not derived from a persistent blastopore, but is formed from an independent proctodæal invagination.—Morphological studies : No. 1, the parietal eye of the Cyclostome fishes, by Dr. J. Beard (plates 6 and 7). Describes the parietal eye in the Ammocœtes of *Petromyzon planeri* in its adult form, also in Myxine.—On some Oigopsid cuttle-fish, by F. Ernest Weiss (plates 8–10). A very interesting study of some Mediterranean cuttle-fish.—On the organ of Verrill in Loligo, by M. Laurie (plate 11). An examination of the structure of this organ proved it to be glandular.

IN the *Journal of Botany* for July, Mr. George Murray begins a list of the Marine Algæ of the exceedingly rich West Indian region ; Mr. F. J. Hanbury describes some forms new to Britain of the very difficult genus *Hieracium* ; and Mr. W. B. Grove a new genus of Fungi, *Pimina*, belonging to the Hyphomycetes, parasitic on another Fungus on the leaves of passion-flowers near Dublin.

IN the *Botanical Gazette* for June, Mr. Charles Robertson begins a paper having for its object an attempt to explain the origin of the zygomorphic form in flowers, on the principle of natural selection. Herr A. F. Foerste describes a number of structures adapted to cross-fertilization in American flowers ; and Mr. F. H. Knowlton a new fossil *Chara* from the Lower Tertiaries in Utah.

American Journal of Science, July.—Upon the relation which the former orbits of those meteorites that are in our collections, and that were seen to fall, had to the earth's orbit, by H. A. Newton. We printed this paper on July 12 (p. 250).—History of changes in the Mount Loa craters (continued), by James D. Dana. This paper deals mainly with Mokuaweoweo, the summit crater of Mount Loa. The history is given of its eruptions from 1832 to 1888, and the subject is illustrated with three plates, giving maps of the island of Hawaii and of Mokuaweoweo with two views of a lava fountain at the eruption of January 1887. The paper is followed by a communication from W. T. Brigham and J. M. Alexander on the summit-crater of Mount Loa in 1880 and 1885.—On an explanation of the action of a magnet on chemical action, by Henry A. Rowland and Louis Bell. These researches have reference to Prof. Remsen's discovery that magnetism has a remarkable action on the deposition of copper from one of its solutions on an iron plate, and to Prof. E. L. Nichols's inquiry into the action of acids on iron in a magnetic field. Their conclusions differ from those of Nichols, inasmuch as they give the exact mathematical theory of the action, while Nichols gives no theory, and does not notice the action of points.—Wave-like effects produced by the detonation of gun-cotton, by Charles E. Monroe. It is suggested that, in the curious phenomena here described, a means may be found for distinguishing between, and perhaps measuring the effects of, different detonating explosives.—A mode of reading mirror galvanometers, &c., by Dr. R. W. Willson. Although less accurate than that of telescope and scale, the method here proposed is stated to be often more convenient.—Bertrandite from Mount Antero, Colorado, by Samuel L. Penfield. The specimen of this rare mineral here studied was selected from some materials collected last summer at Mount Antero, in the search for specimens of phenacite. Its hardness is determined at 6–7, and specific gravity 2·598 ; while analysis yielded SiO_2, 51·8 ; BeO, 39·6 ; H_2O, 8·4 ; CaO, 1·0.—W. W. Dodge determines some localities of post-Tertiary and Tertiary fossils in Massachusetts ; E. O. Hovey describes a Cordierite gneiss from Connecticut ; and W. Hallock has a short note on the flow of solids.

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THE original articles in the *Nuovo Giornale Botanico Italiano* for July comprise a description, with plate, of a singular proliferous specimen of an *Agaricus*, by Signor U. Martelli; a summary of the characters of twenty-two of the principal varieties of the vine grown in the neighbourhood of Arezzo, by Signor L. Macchiati; and contributions to the flora of Massana, by Signor U. Martelli. In the Reports of the Proceedings of the Italian Botanical Society, is an interesting article by Signor G. Arcangeli, on Kefir, an alcoholic and effervescing drink, prepared in the Caucasus by the fermentation of cows' milk. The author confirms the statement of previous observers that in the fermented liquid there are always found a *Saccharomyces* very closely allied to *S. cerevisiæ*, and several Schizomycetes. The organism of the latter class described by previous writers as *Dispora caucasica*, and regarded as peculiar to this kind of fermentation, he identifies with *Bacillus subtilis*, which is accompanied by *B. acidi lactici*. Signors Martelli and Macchiati contribute papers on the freshwater diatoms of the district of Modena.

Revue d'Anthropologie, troisième série, tome iii., quatrième fasc. (Paris, 1888).—Continuation of the stratigraphic palæontology of man, by M. M. Boule. In this essay the writer treats of the most recently established conclusions regarding the chronological order of the erratic deposits of the valleys of the Rhone, the Saône, and the Ain, which belong to the Quaternary and the Upper and Middle Pliocene ages. He agrees with the generally accepted opinion that the existence of interglacial deposits has been established by scientific evidence, while the identity of the animals and plants everywhere found in these beds prove that they must be nearly contemporaneous. The discovery last year by M. Tardy of a stone implement of the Saint-Acheul type, which was embedded in the alluvial banks of the Ain, and near intact moraines, would seem to connect the presence of man with one of these interglacial periods, while Dr. Penck has shown that each retrogression of a glacier corresponds to a period of alluvial deposit in valleys. Passing from the Alps to the Pyrenees, M. Boule, again following the same authority, shows that, while in the former region there is at many points evidence of repeated glaciation, in the latter the moraines rest directly on ancient rocks. Numerous other difficulties surround the question of glaciation in the Pyrenean range, and the interest of M. Boule's essay depends largely upon the care with which he has sifted the evidence derived from the numerous writers to whom he refers; and the English student will find this section of his work a useful guide to the bibliography of the subject in regard to Auvergne, as well as to the Swiss and French Alps.—The Afghans, by M. L. Rousselet. The excessive admixture of races which is to be found in the land of the Afghans is considered by the author as one of the most curious features of their ethnic history. The physical characteristics of the Afghans of Cabul and Candahar point to an Aryan origin, and would seem to ally them with the Sikhs and Rajputs of North-Western India; while the occasional appearance among the inhabitants of the larger cities of what is commonly known as the Jewish type of face is, according to M. Rousselet, sufficiently explained by the important part which from the earliest period of Islamism Arabs have taken in converting the Afghans to the faith of the Prophet. From Chinese authorities we learn, moreover, that before the middle of the sixth century invaders of a Turcoman race had entered the land of the Afghans, and subjugated some of its tribes. In the tenth century another Turcoman invasion confirmed the domination of the Mohammedans, and since then the Koran has constituted the national code; but, although of the Sunnite sect, the upper classes adhere to the tongue of their heretical neighbours, the Chiite Persians. The theory advocated by many English writers, that the Afghans are descended from the ten lost tribes of Israel, is treated by the writer as unworthy of all serious consideration. He cannot see in this people, of variously composed ethnic elements, anything that demands the establishment of a far-fetched theory to explain their history or character; but he thinks that, in spite of their want of national cohesion, they may—through their love of freedom, the independence secured to them by their geographical position, and their warlike instincts—at no very distant date be called upon to decide the fate of India.—Contributions to the history of anomalous muscles of the neck and back, by M. Ledouble. In this paper the examples cited of such anomalies have been principally taken from the printed reports of Mr. John Wood, Profs. Macalister, Flower, Huxley, &c.—Notes on the Département de l'Ain, by Dr. Aubert. These notes supply an interesting account of the mode of formation and nature of the innumerable ponds and marshes which long gave so peculiar a character to the districts of Dombes, Bresse, and Bugey, in which the great preponderance of standing waters has been for centuries a source of poverty and disease to the unfortunate inhabitants. The existence of such vast areas of more or less deep still-waters is dependent upon a geological cause which must always have been in force, since they owe their origin to the impermeability of the soil beneath them; but it would appear that prior to the fourteenth and fifteenth centuries, when the process of so-called *evolage* and *assec* was first established in these districts, the country was healthier and more populous than it has been in more recent times. This system—which consists in drawing off the waters of certain ponds every third year, and sowing the wet ground with barley and oats after the vast accumulations of fish have been cleared off—naturally gives rise to mephitic effluvia, inducing malarian diseases. These and other evils due to the system of *evolage* had the effect of gradually reducing the population to twenty-four inhabitants to the square kilometre, and giving an average longevity of less than twenty-one years. This state of things, which reached its maximum about the middle of this century, has been steadily improving since the draining of the ponds has been systematically taken in hand. At the present time 6000 hectares of land have already been recovered, and, while fevers have diminished, the tables of conscription show that, whereas in some cantons the numbers of rejections among the recruits were from 80 to 90 per cent. between 1837 and 1847, they had fallen between 1872 and 1886 to below 10 per cent. Dr. Aubert's notes supply an interesting commentary on the practical importance of applying scientific knowledge to the elucidation and modification of the physical condition of the soil, even where this seems to be dependent on apparently unalterable geological causes.—The formula for reconstructing the human figure in accordance with dimensions of the long bones, by M. Topinard. This is little more than a critique of Dr. Beddoe's paper on the stature of the ancient races of England.

Rivista Scientifico-Industriale, June 30.—Note on microscopy (continued), by Prof. Aser Poli. After a rapid survey of the various improvements or modifications introduced by Huyghens, Campani, Ramsden, and other oculists, the author proceeds to examine critically the suggestions recently made by Mr. E. M. Nelson in connection with Campani's eye-piece (Journal of the Royal Microscopical Society, 1887, p. 928). By a simple calculation, in which numerals are substituted for letters in the well-known formula, he shows that the theory is directly opposed to Mr. Nelson's statement. The assertion is also questioned that his theoretical conclusions have been confirmed by practical experiment.

SOCIETIES AND ACADEMIES.

PARIS.

Academy of Sciences, August 13.—M. Janssen, President, in the chair.—Remarks in connection with the "Connaissance des Temps pour 1890" (212th year of publication), presented to the Academy by M. Bouquet de la Grye. Amongst the improvements and additions made to this volume are: the semi-diameter of the sun, the duration of its transit, the parallax and aberration for every day in the year, the conditions of visibility of Saturn's ring, and tables for calculating the phases of the solar eclipses for every point on the surface of the globe. By means of certain typographical expedients, all these additions have been made without increasing the size of the volume.—On a general property of elastic solid bodies, by M. Maurice Lévy. A demonstration is offered of the following theorem: If two systems of forces in equilibrium be successively applied to an elastic solid body, whether isotropous or crystallized, free or not (and consequently to a system of similar bodies connected together in any way), then the sum of the work produced by the forces of one of these systems, for the elastic displacements due to the other, is equal to the sum of the work produced by the forces of the latter for the elastic displacements due to the first.—On the influence exercised by antipyretic substances on the quantity of glycogen contained in the muscles, by MM. R. Lépine and Porteret. In a previous note (*Comptes rendus* for April 3, 1888), the authors showed that antipyretic substances act as an impediment to the transformation of the hepatic glycogen into sugar. They now give the results of their further researches on the influence exercised by the antipyrine and acetanilide in determining

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